

Claims

1. A database system for organizing data elements according to a Hilbert curve,
said data elements being representable by a plurality of coordinates, said
5 database system comprising:

first means for generating a plurality of bitblocks by bitwise interleaving the
coordinates of the data elements;

second means for applying a fliprot transformation to a first bitblock;

10 said fliprot transformation comprising a flip transformation and a rot
transformation, said flip transformation inverting bits of said bitblock, said rot
transformation interchanging bits of said bitblock;

third means for obtaining, for each further bitblock, a fliprot transformation by
a concatenation of two or more fliprot transformations; and

15 fourth means for applying fliprot transformations to their corresponding
bitblock;

whereby the bitblock bits determine the organization of said data elements
according to said Hilbert curve.

- 20 2. A method of organizing data elements of a database according to a Hilbert
curve, said data elements being representable by a plurality of coordinates, said
method comprising the following steps:

generating a plurality of bitblocks by bitwise interleaving the coordinates of the
25 data elements;

whereby a predetermined fliprot transformation is applied to a first bitblock;
said fliprot transformation comprising a flip transformation and a rot
transformation, said flip transformation inverting bits of said bitblock, said rot
transformation interchanging bits of said bitblock;

30 for each further bitblock, a fliprot transformation is obtained by a
concatenation of two or more fliprot transformations;
and fliprot transformations are applied to their corresponding bitblock;

whereby the bitblock bits determine the organization of said data elements according to said Hilbert curve.

3. The method according to claim 2, wherein said rot transformation cyclically shifts the bits of said bitblock.
4. The method of claim 2, wherein organizing is a means for at least one of searching, sorting, storing, retrieving, inserting, deleting, querying, range querying, data elements in said database system.
5. The method of claim 2 for range querying data elements in said database, with a BIGMIN calculation including a candidate calculation wherein said candidate is kept in form of rectangle data.
- 15 6. A computer-readable data storage medium for storing program code for executing, when being loaded into a computer, the method according to claim 2.